DOCUMENT RESUME

ED 326 174 HE 024 080

TITLE	Economic Competitiveness and International Knowledge. A Special Policy Briefing for Rhode Island Legislators.
INSTITUTION	New England Board of Higher Education, Boston, MA.
SPONS AGENCY	AT&T Communications, Inc., New York, NY.
PUB DATE	Feb 89
NOTE	76p.; For related documents, see HE 024 076-081.
PUB TYPE	Reports - Descriptive (141) -- Information Analyses (070)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	*College Role; Economic Change; *Economic Development; Economic Impact; *Educational Cooperation; Educational Needs; Financial Support; Global Approach; Higher Education; *International Trade; Regional Programs; Research and Development; School Business Relationship; Technology Transfer
IDENTIFIERS	*New England; *Rhode Island

ABSTRACT

A policy briefing report discusses the initiatives currently in place in Rhode Island that are designed to enhance that state's economic and educational effectiveness in order to improve its international competitive position. The report is divided into four major areas of discussion: (1) an overview of the global economic challenge and the New England Board of Higher Education project that addresses international competitiveness; (2) Rhode Island's economy within the international context; (3) Rhode Island's programs for enhancing its international economic competitiveness; and (4) the role and development of higher education in Rhode Island in preparing the state for international economic competition. Included in the areas examined are the state's federal and regional resources, state-level strategies, international trade initiatives, educational initiatives, research and development (R&D) investment, and technology transfer and technical assistance. In addition, the concern about a lack of international awareness, what is being done about it, and recent legislative activity are discussed. Recommendations are made in education and training, stimulation of international awareness, R&D investments, technology transfer, and technical assistance. An appendix includes a trade profile for Rhode Island. (GLR)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED326174

NEW ENGLAND BOARD OF HIGHER EDUCATION

ECONOMIC COMPETITIVENESS AND INTERNATIONAL KNOWLEDGE

A SPECIAL POLICY BRIEFING
FOR
RHODE ISLAND LEGISLATORS

February 1989

A Regional Project on the Global Economy
and Higher Education in New England

HE 024 080

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

New England Board of Higher Education

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

45 TEMPLE PLACE, BOSTON, MA 02111 (617) 357-9620

ECONOMIC COMPETITIVENESS AND INTERNATIONAL KNOWLEDGE

A Special Policy Briefing
for
Rhode Island Legislators

February 1989

Prepared
by
The New England Board of Higher Education
45 Temple Place
Boston, Massachusetts
(617)357-9620

@ Copyright by the New England Board of Higher Education 1989
All Rights Reserved

ACKNOWLEDGEMENTS

The New England Board of Higher Education project on The Global Economy and Higher Education in New England, including the Rhode Island perspective, which follows, has had the benefit of two years of staff research prior to the commencement of a series of legislative briefings in each New England state. The Board is grateful to the AT&T Foundation for partially underwriting this regional project in behalf of state legislators throughout the region. In many respects, AT&T exemplifies the knowledge-based, globally oriented frontier of worldwide telelcommunications which will shape international economic, political and cultural affairs as we approach the 21st century.

PROJECT STAFF

John C. Hoy, President, New England Board of Higher Education
JoAnn Moody, Associate Vice President and Legal Counsel, NEBHE
Sven Groennings, NEBHE Senior Fellow
Richard D. King, NEBHE Senior Fellow

This analysis for the state of Rhode Island has been prepared by:

Judith Beachler, Director of Research, NEBHE
John O. Harney, Assistant to the President, NEBHE

PREFACE

The Regional Project on the Global Economy
and Higher Education in New England

by

John C. Hoy, President
New England Board of Higher Education

How important is the international dimension of New England's economy? How much do our colleges and universities contribute to the region's competitive position in the global economy?

To answer these questions, the New England Board of Higher Education has initiated a study of the role the region's institutions of higher education can be expected to play in the world marketplace. The study has three research components: an analysis of the internationalization of the New England economy; a region-wide assessment titled: The Future of New England Survey which reviewed the attitudes of the corporate, government and university leaders on what higher education should do to prepare us for the global economy; and a 40-campus study of what is and is not happening on our

campuses. NEBHE has also published these preliminary studies: Economic Competitiveness and International Knowledge and The Impact of Economic Globalization on Higher Education.

Corporate executives, economists and leaders in higher education have generously advised the Board and contributed to the preparation of the following perspectives and recommendations.

PERSPECTIVES

* The massive U.S. trade deficit is an urgent problem for New England and the nation. At both the regional and national levels, overcoming this condition requires an inter-related set of long-term strategic approaches involving business, government and education.

* New England has become a significant partner in the knowledge-based global economy. The export of innovative technological products and advanced professional services are among its greatest growth fields. The more the economy moves into high tech and sophisticated services, the more international it becomes. We face a fundamental change in our economic system as operations in fields ranging from finance to advanced manufacturing compete in global markets. New England's comparative advantage in high quality technology and knowledge-intensive services depends on a well-educated, high-skilled work force.

* In a knowledge-based global economy, we are competing not only with other economic systems, but with the research and educational systems of our competitors. Economic competitiveness requires educational effectiveness: our work force must have basic math and computer skills and scientific, technological and international knowledge at least equal to that of our major world competitors. Public understanding of the new global economy is crucial because international competitiveness will become central to the framework and

substance of state and federal policies affecting the domestic economy. And the global economy already touches our lives directly every day: 80 percent of all U.S. goods now face international competition either at home or abroad.

* The challenges of the global economy confront not only business and public policy-makers. Colleges and universities are major stakeholders in the New England economy. They are the primary generators of new scientific and technical knowledge which is critical for economic competitiveness. They are the chief sources of new international understanding and the competencies increasingly required in most fields. Higher education is also a major global resource. Beyond its expertise concerning other countries and peoples, higher education is one of the strongest competitive features of the economies of New England and the nation. It is a major export sector providing services to an international clientele.

The central issue: How will higher education, government and business meet the challenges before them?

RECOMMENDATIONS AT THE REGIONAL LEVEL

1. Collect the facts. Throughout the planning stages of the NEBHE project, it has become clear that up-to-date information on state-by-state trade--export-import data--as well as factual information on direct foreign investment is woefully inadequate to keep up with changes in the economy. The most recent available trade data is for 1984. Four very significant years have passed during which international economic activity is estimated to have expanded at historic rates. We anticipate that in January 1989, the U.S. Department of Commerce will be in a position to release 1985-86 information which will be useful in updating state and regional analyses. Still, there is virtually no data on one of New England's most significant economic sectors: professional services such as scientific research, law medicine, management

consulting and higher education. Each New England state should implement and support a collaborative program to annually gather the facts concerning economic activity. In addition, a regional analysis of state and federal data should become a part of New England's global outreach program. With cooperation between NEBHE and regional business organizations, a clearinghouse should be created for the the development and dissemination of New England international economic data. The data should be disseminated to the region's governors, state legislators and leading executives, as well as colleges and universities.

2. Broaden the discussion. High-visibility regional conferences and greater communication with the media should be used to develop understanding of our region's place in the global economy. Conferences should include well-known business, higher education and government leaders. The conferences should address the importance of international trade and investment to New England, our region's competitiveness problems and their consequences, and ways to develop collaborative action among business, education and government to advance New England's competitiveness.

3. Seek to focus federal legislation. Our New England congressional delegation should consider ways to make the Higher Education Act (HEA) and other federal legislation key instruments of adaptation to the new global economy. The Congress, through the recent Omnibus Trade and Competitiveness Act, has taken the first steps by amending the HEA to authorize support for international business centers and technology transfer centers. The HEA's basic emphasis on access and opportunity is still needed, especially as we will need the contributions of all Americans to be economically competitive. It is becoming imperative, however, to move beyond access toward outcomes which will advance competitiveness.

RECOMMENDATIONS FOR HIGHER EDUCATION INSTITUTIONS

1. Initiate institutional planning. The implications of the global economy apply to all aspects of academic institutions' operations, including curriculum, faculty and library development, exchange programs, institutional linkages, external relations and administration. International competition elevates the importance of international education. We recommend that campuses undertake strategic planning aimed at evaluating their strengths, weaknesses and potential with regard to the global economy.

2. Build business-academic partnerships. Academic institutions are positive forces in attracting foreign investment to our communities. But the academic community is an underutilized resource for New England's international economic development. As a first step toward building partnerships beneficial to our campuses and region, we recommend that colleges and universities systematically address the strengths they can offer to the business community and to agencies such as regional development authorities.

3. Provide analysis. New England academic institutions are providing negligible data, analysis or perspective on the internationalization of the New England economy. The region has no academic institute focusing on New England international trade, investment or services, no institute focusing on the global economy more broadly, and no significant academic network of people working on these issues. Although there have been superb recent academic studies of the global business system, provocative analyses of competitiveness problems, and increased academic attention to business relations with Canada, our region lacks a strong institutionalized focus on its place in the global economy. Corporate and political leaders have no place to turn for an overview, and no place providing regionally focused material for teacher and citizen education. It is important for New England to have accurate and

comprehensive data and first-rate analysis. We recommend that our higher education institutions address this problem.

4. Focus on the global economy in the liberal arts. We asked corporate, government and higher education leaders to indicate the most important ways that colleges and universities can prepare our work force for a global economy. The respondents considered it most important to "design an undergraduate curriculum that ensures understanding of a global economy," even ranking this challenge ahead of the need to "expand the supply of scientifically and technically educated men and women." The liberal arts can familiarize undergraduate students with the concerns that will affect their lives and careers. The globalization of the economy and U.S. international competitiveness will clearly influence the lives of our graduates whether or not they become employed by firms involved in international trade. No institution offers an introductory course on the global economy. We recommend that institutions include a course on the global economy in their basic curricula and make materials available for in-service teacher education programs.

5. Develop faculty competencies in both business schools and the liberal arts. There is a shortage of qualified people with international backgrounds to serve on business school faculties, while there is a pervasive need for current faculty members to be able to integrate international knowledge into business school curricula. Among faculty members in the liberal arts, there is a parallel inadequacy to provide a global economic and business perspective. Moreover, our faculties have little understanding of the international dimensions of the New England economy. We recommend the creation of a faculty development program designed to produce multiplier effects on the campuses and to build strong bridges between business and liberal arts faculties.

6. Connect business studies with foreign language and world area studies. We find a growing need to link foreign language study and international courses with business programs. The need is particularly great with regard to Asia, where our negative trade balance coincides with weakness in academic preparation concerning the region and its culture. Businesses increasingly need people who combine area knowledge with business knowledge. We also find it increasingly important for those whose pursuit is area studies to understand the growing importance of economics in international relationships and the essential features of the global business system. We recommend that our higher education institutions emphasize these relationships.

7. Arrange internships in international business. New England students have few opportunities to benefit from experience in companies outside the United States or in internationally focused companies within New England. At the same time, the growth of foreign alumni contacts and the international aspects of New England-based companies, as well as the establishment of 1,500 foreign subsidiaries in New England, provide prospects for increasing the number of internationally focused internships. Internships contribute to student competence, cross-cultural understanding and career direction and momentum. Their availability alone signals the importance of international business and induces especially able students to include international aspects of business in their career planning. Lasting programs rather than ad hoc arrangements are needed to provide organizational bases for the expansion of opportunities. We recommend corporate-academic collaboration to create internship programs and suggest establishment of selection processes parallel to those used in awarding prestigious fellowships.

8. Provide continuing education and outreach to the business community. Corporate personnel and business faculty have indicated a widespread and increasing need for outreach programs to advance the understanding and competencies needed in the global economy. One clear audience is the high-tech community and its engineer-managers whose interest is in policy frameworks, international corporate coalitions, technology transfer and managing and negotiating across cultures. With notable exceptions, New England colleges and universities have not yet offered appropriate courses and seminars in convenient locations or at convenient times for business personnel, nor have they been utilizing new interactive and other learning technologies to reach these audiences. We recommend collaboration between business and higher education in conceptualization, market analysis and delivery of internationally relevant programs. We also recommend attention to the possibility of designing degree programs combining engineering and technical study with a program of international management.

PROJECT OUTLOOK

As the Regional Project on the Global Economy and Higher Education in New England proceeds, the NEBHE staff are confident that as state legislatures commence their 1989 agenda, NEBHE state house briefings for new and returning elected officials will be well-received throughout the region.

The project is a long-term effort on the part of NEBHE to assure consistent attention to disseminating the results of effective state initiatives throughout the region.

I. THE GLOBAL ECONOMIC CHALLENGE

The loss of international economic competitiveness experienced in the United States over the past two decades has been well-documented. The facts reveal a decline in productivity growth, periodic national and regional recessions; growth of federal budget deficits as well as international trade deficits; the decline in the U.S. share of worldwide gross national product; U.S, decline in nondefense research and development expenditures as a percent of U.S. GNP; the lagging performance of U.S. students behind those of other countries both on comparative achievement tests and decline in high school completion; the fall in the numbers of U.S. students pursuing doctorates in science and technical fields...the list of documented factors goes on. It has become clear that state inititatives in behalf of international competitiveness are required. This is a new role for the states--the territory is not well charted.

New England has fared far better than the nation as a whole over the past decade and continues to be cited both nationally and internationally as the prime example of the nation's capacity to reindustrialize. New England has experienced advanced industrial development based upon pre-eminent scientific infrastructure and technological innovation. The region's unequaled higher education infrastructure has been credited for its primary impact on New England's economic renewal.

Nonetheless, New England is now at a major crossroad. With an economy that is no longer in the vibrant phases of economic survival, how can the region sustain its recent success? More importantly, how can we meet the complex challenges of intense international economic competition? Economies capable of fostering a resourceful and flexible workforce that utilize swiftly changing advanced technologies in an efficient and effective manner are those

that will meet this challenge. The result: There are new demands on our corporations, governments and institutions of higher education. A well-educated workforce has been and will be the primary advantage.

The New England Board of Higher Education's Regional Project on the Global Economy and Higher Education was established in 1987. Through several background papers, a region-wide survey of corporate, education and government leaders, and publication of reports in Connection, New England's Journal of Higher Education and Economic Development, over the last two years, the NEBHE staff have analyzed new ways for the region's higher education community to join in partnership with New England businesses and governments to meet the global economic challenge. A case study* review explores initiatives that have been devised to address this issue. And finally, based upon this review, recommendations have been made to close the gap between actual and potential strategies devised to enhance New England's competiveness in commerce, industry and technological innovation. What follows is a summary of the issues as they pertain generally to the region and more specifically to the state of Rhode Island.

The underlying premise of this project is that competition on a global basis, though not significantly different from competition at home, is a far more complex and demanding challenge. As New England continues to move from an industrial economy to a knowledge-intensive economy based upon emerging advanced technologies and sophisticated services, we are entering an era highly dependent upon skilled human capital development. For this reason alone, institutions of higher education will become key players in regional initiatives to meet the global economic imperatives.

The world economy, not the domestic economy, will grow significantly over the next several decades. New England's strong state and regional economies must be nurtured so they are well-positioned to take advantage of available

worldwide markets. The global market place requires an understanding of the strengths of each state's economy in an international context and the interstate and national context which each will address in the decade ahead.

There are two underlying issues which the New England states must address with fresh policy initiatives and subsequent actions in order to meet the challenges of international economic realities:

- During the era of transformation from an industrial to a knowledge-intensive economy, human capital development has been the key to meeting the international economic challenge. Therefore, both the nation and New England continue to require high-quality higher education. Both short-term and long-term higher education initiatives must be stategically developed. The accurate response will require in-depth collaboration among business, education and government organizations..

- As many U.S. markets mature, international markets are beginning to grow. The world economy will experience greater levels of growth than the domestic eeconomy over the next few decades. New England industries must adapt to this change if the regional economy is to continue to expand.

II. RHODE ISLAND'S ECONOMY IN AN INTERNATIONAL CONTEXT

Foreign Investment in Rhode Island

In the last year, the level of foreign investment in the United States has sparked concern. But studies by regional and national economists suggest that to date the impact is relatively small both in New England and in the nation. The investment by foreign-owned companies that has occurred has added diversity to local economies. This is a strength for New England over the long term. In any case, as global trade increases, foreign investment in the United States and by U.S. firms in other nations is very likely to continue increasing.

As a percent of non-farm employment, employment by foreign-owned companies is lower in Rhode Island than any other New England state (See Table 1). The influence of foreign affiliates is also comparatively less significant by several other measures. In 1985, Rhode Island ranked among the last five of all states in the total number of foreign affiliates with property, plant and equipment, the gross book value of their property and in the acres of land owned by foreign affiliates. Only in terms of employment by foreign affiliates per 1,000 population did it rank in the top half nationally, at 22nd.

TABLE 1

Foreign Employment in New England: 1986

(numbers in thousands)

	Non-farm Employment* (1)	Employment in Foreign Companies+ (2)	Percent in Foreign-owned Companies**
CT	1,267.0	50.7	4.0%
ME	367.0	21.7	5.9%
MA	2,390.0	76.7	3.2%
NH	399.0	16.7	4.2%
RI	359.0	11.2	3.1%
VT	185.0	7.0	3.8%
NE	4,965.0	184.1	3.7

*The government and financial sectors were removed from total non-farm employment for compatability purposes with non-bank company affiliates data.

+U.S. Department of Commerce data for non-bank foreign company affiliates

**Figures in Column (2) as percent of those in Column (1)

Note: Figures may not add up to totals due to rounding

Source: Wentrup, Hans J., "Foreign Ownership Has Only Mild Impact," New England Business, December 1988; and U.S. Department of Commerce, Statistical Abstract of the United States, 1988.

Manufactured Exports: Their Impact

The United States experienced flat growth in exports from 1981 through 1986, while import rates grew at approximately 7.5 percent per year. The nation saw modest improvement in exports, beginning in early 1987. By mid-1987, American exports were surging and continued to do so throughout 1988. Although continued strength in imports has prevented significant improvement to the trade balance, the U.S. trade deficit by September, 1988, shrank to its lowest level in three years.

The current export boom has been attributed, in part, to a weakened U.S. dollar, yet many economists note other important factors. These factors include: continued vitality in service exports (the trade balance for the service sector was in the black even when overall deficits were at record highs, but projections for 1988 suggest the service sector has lost strength), a new emphasis by the nation's exporters on making quality products and developing leading-edge technology, the return home of some manufacturing that had been shifted to nations with lower labor costs, and the relative strength of foreign economies, particularly Japan's and Europe's, that are able to absorb U.S. exports both now and in the forseeable future.

Still, exporting has not come naturally to U.S. companies. In 1987, exports represented only 5.4 percent of U.S. GNP, compared with 26 percent of West Germany's GNP, 25 percent of Canada's, and 10.5 percent of Japan's.

The United States has long been considered the world's richest market, and U.S. businesses have established a frame of reference that generally ends at the Atlantic and Pacific oceans. The breadth of the domestic market has left U.S. businesses relatively ignorant of foreign cultures, languages and markets. Now, we must expand our international awareness.

Dollar Value of Manufactured Exports

New England holds a unique position in the United States in terms of export industries. And the state of Rhode Island holds a unique position within the region.

New England's manufactured exports totaled $20.9 billion in 1986, 15.5 percent more than in 1984. The region's largest exporting industries included non-electrical machinery, electronics, transportation equipment, scientific instruments, and fabricated metals. These five industries accounted for approximately 71 percent of the value of the region's manufactured exports.

Non-electrical machinery, the region's largest industry, totaled $5.5 billion in 1986, almost 20 percent above the 1984 level. Twelve percent of the dollar value of the nation's total exports in this industry were made in New England.

The region's exports of electronic equipment were valued at $4.1 billion, approximately 32 percent above the 1984 level. This industry accounted for 9.6 percent of the electronics industry's total dollar exports nationwide. Scientific instruments exported from New England ranked fourth in total dollar value. However, New England's export of scientific instruments represents almost 15 percent of the value of all scientific instruments exported from the United States. Rhode Island's five leading exports in the dollar value of shipments were miscellaneous manufacturing industries, primary metals, electronics, non-electrical machinery and fabricated metals. (See Table 2).

TABLE 2

Value of Top Ten Export-Related Manufacturing Industries

in Rhode Island: 1984 and 1986

(in millions of dollars)

INDUSTRY	1986 VALUE	1984 VALUE
MISCELLANEOUS MANUFACTURING INDUSTRIES	200.7	156.5
PRIMARY METAL INDUSTRY	150.3	135.8
ELECTRIC AND ELECTRIC EQUIPMENT	141.7	110.8
NON-ELECTRICAL MACHINERY	130.4	96.8
FABRICATED METAL PRODUCTS	122.4	109.8
TEXTILE MILL PRODUCTS	84.7	84.6
RUBBER AND MISCELLANEOUS PLASTIC PROD.	54.4	56.1
CHEMICAL AND ALLIED PRODUCTS	51.0	54.0
SCIENTIFIC INSTRUMENTS	35.3	35.4
FOOD AND KINDRED PRODUCTS	20.4	17.4

*Industries are listed in highest to lowest in order of the 1986 dollar value.
Source: U.S. Bureau of the Census, Annual Survey of Manufacturers Origin of Exports of Manufacturing Products, 1984 and 1986, Table 5a.

In real dollars, miscellaneous manufacturing is the largest export industry. But this industry ranked 5th in terms of what share of total production was exported, suggesting that more of these industrial products remain in the United States. By the latter measure, non-electrical machinery, primary metals, electronics and textiles rank first through fourth. More than 25 percent of the value of non-electrical machinery, more than 23 percent of the value of primary metals, almost 17 percent of electronics and almost 14 percent of textiles products were exports (see Table 3).

What is impressive in Rhode Island is the degree to which the percentage of the value of its top two export industries has grown from 1984 to 1986. Non-electrical machinery exports grew by more than 4 percent, while primary metals exports grew by more than 3 percent. Among all the top ten industries, the share dedicated to exports also grew, with just two execeptions: rubber/plastic products and paper/allied products.

TABLE 3

The Value of Manufactured Exports

as a Percent of Total Shipments by Industry:

Rhode Island & the U.S. in 1984 and 1986

Industry+	1986		1984	
	Rhode Island	United States	Rhode Island	United States
Non-Electrical Machinery	25.1	22.8	20.9	21.5
Primary Metal Industries	23.3	23.3	20.2	19.5
Electric and Electronic Equip.	17.8	21.3	15.1	18.2
Textile Mills Products	13.7	8.2	12.9	7.4
Chemical and Allied Products	13.4	17.4	13.1	16.6
Misc. Manufacturing Industries	12.7	8.2	9.2	7.4
Rubber & Misc. Plastric Products	12.7	13.0	12.8	11.7
Paper and Allied Products	10.8	12.0	14.0	10.6
Stone Clay & Glass Products	10.6	7.3	10.1	7.2
Fabricated Metal Products	10.0	12.9	9.7	11.6
Scientific Instruments	9.9	16.5	7.7	15.4
Apparel and Other Textile Products	4.9	3.6	4.6	3.0
Food and Kindred Products	4.8	5.0	4.3	4.8
Lumber and Wood Products	3.9	8.8	3.7	8.3
Printing and Publishing	3.4	4.3	3.6	4.2
Transportation Equipment	1.8	13.6	4.3	12.8
Tobacco Products	0.0	12.1	0.0	14.6
Petroleum and Coal Products	0.0	9.1	0.0	7.8
Leather and Leather Produducts	0.0	8.8	0.0	6.8
Furniture and Allied Products	0.0	2.8	0.0	2.7
All Industries	12.7	13.0	11.1	11.9

+Industries are listed in order of size (exports as percentage of total industries) in the state of Rhode Island.

Note: Includes employment in the manufacture of goods that become components of other goods that are exported

Source: U.S. Bureau of the Census, Annual Survey of Manufactures, Origin of Exports of Manufactured Products, 1984 and 1986, Tables 4a and 5a.

Approximately 5.1 percent of the region's exported manufactured goods and .4 percent of the nation's are made in Rhode Island. Almost 13 percent of all Rhode Island's products, slightly less than the U.S. average in 1986, were exported to foreign nations. Rhode Island's top industries have seen substantial growth from 1984 to 1986. However, as a percent of the value of all goods manufactured in the state, exports represent a smaller portion than in any other New England state (see Table 4).

TABLE 4
Value of Manufacturing Industries Exports
New England and the U.S.: 1984 and 1986

	1984				1986			
	Value of Exports ($'s in millions)	Exports as % of Total Shipments	Share of N.E. Exports (in %)	Share of U.S. Exports (in %)	Value of Exports ($'s in millions)	Exports as % of Total Shipments	Share of N.E. Exports (in %)	Share of U.S. Exports (in %)
CT	5,435.5	15.6	30.0	2.0	6,186.0	17.2	29.6	2.1
ME	1,215.0	12.2	6.7	.5	1,393.0	13.8	6.7	.5
MA	8,767.6	15.0	48.4	3.3	9,724.7	15.9	46.6	3.3
NH	1,128.8	12.9	6.2	.4	1,661.7	17.6	8.0	.6
RI	946.4	11.1	5.2	.4	1,068.9	12.7	5.1	.4
VT	617.2	16.2	3.4	.2	833.9	20.1	4.0	.3
NE	18,110.5	14.5	100.0	6.8	20,868.2	16.2	100.0	7.1
US	268,278.0	11.9		100.0	294,339.5	13.0		

Note: Figures may not add up due to rounding.

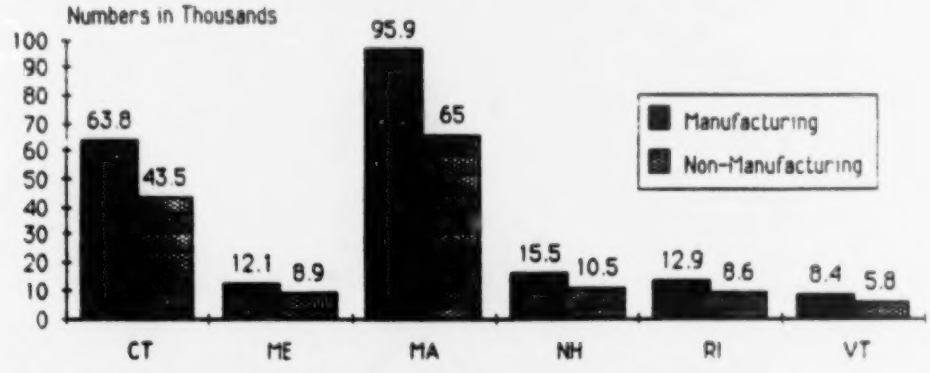
Source: U.S. Bureau of the Census, Annual Survey of Manufactures, Origin of Exports of Manufactured Products, 1984 and 1986, Tables 4a and 5a.

Employment Related to Manufactured Exports

Throughout New England, export-related industries accounted for over 350,900 jobs in 1986, 12.5 percent more than in 1984. Approximately 208,600 of these jobs were in manufacturing industries, which directly produced the exports, while 142,300 were in export-related jobs in industries including transportation, communications, agriculture and business services (these same industries also export). Although New England is home to only 5 percent of the nation's population, it accounts for almost 8 percent of U.S. export-related employment. In addition, New Englanders hold 9 percent of all U.S. export-related manufacturing jobs. (See Figure 1 for more detail on manufacturing employment)

FIGURE 1

Employment Related to Manufactured Exports: 1986



Note: Includes employment in the manufacture of goods and services that are components of other goods that are exported.

Source: U.S. Bureau of the Census, Annual Survey of Manufactures, Origin of Exports of Manufactured Products, 1986, Table 2a.

In 1986, Rhode Island industries accounted for 6 percent of New England's export employment. Rhode Island, however, is the only New England state that did not recover from the 1984 decrease in export-related employment and exceed its 1980 level in 1986. The state's export-related employment declined by almost 25 percent from 1980 to 1984 and grew by only 12.6 percent between 1984 and 1986, still 8.5 percent lower than the 1980 level. Clearly, Rhode Island ought to consider inititatives to continue enhancing export trade. But the export picture may be improving. As noted in the following section, the export trade deficit at least with Canada decreased dramatically in 1987(See Table 5 below).

TABLE 5
Employment Related to Manufactured Exports in New England and the United States: 1980, 1984 and 1986

	Export-Related Employment*								
	In Thousands			As Percent of Total Civilian Employment			Rank Among 50 States+		
Area	1980	1984	1986	1980	1984	1986	1980	1984	1986**
Connecticut	105.8	96.9	107.3	6.7	6.0	6.5	1	1	
Maine	19.5	18.8	21.0	4.2	3.6	4.0	28	22	
Massachusetts	151.4	144.9	160.9	5.5	5.0	5.5	11	3	
New Hampshire	23.0	21.6	26.0	5.4	4.5	5.2	13	8	
Rhode Island	25.4	19.1	21.5	5.9	4.3	4.5	5	11	
Vermont	11.2	11.1	14.2	4.7	4.4	5.1	20	9	
New England	336.3	312.6	350.9	5.5	5.0	5.5			
United States	4,808.3	4,096.7	4,576.6	4.8	3.8	4.1			

*Includes employment in the manufacture of goods and services that become components of other goods that are exported.

+Rank order is of export-related employment as percent of total civilian employment.

** Not yet available

Source: U.S. Bureau of the Census, Annual Survey of Manufactures, Origin of Exports of Manufactured Products, 1984 and 1986, Table 2a, and 1981, Table 2b.

New England Trade With Canada

State and regional policy-making is hampered by a lack of timely U.S. data on imports and exports. Although U.S. Bureau of the Census data provide descriptive information about employment in export industries and the value of their products, the data is old, and little is known about the current scenario. In addition, little is known about the import side of the trade equation at the state level.

The Canadian Government, on the other hand, provides data on import/export trade among all the Canadian provinces and U.S. states within three months of the close of each calendar year. Information on trade over time between Canada and New England is crucial because a large portion of our exports are destined for Canadian provinces.

The Canadian Consulate located in Boston provided 1987 figures for the following analysis, including the following table (Table 6) which shows that the trade deficit decreased substantially. Exports from Rhode Island to Canada increased by more than 8 percent from 1986 to 1987, while Canadian exports to Rhode Island decreased by 47 percent.

TABLE 6

New England State Trade with Canada: 1986 and 1987

(in millions of U.S. dollars)

	1986			1987			1987 over 1986 % Increase in Exports to Canada
	Imports from Canada	Exports to Canada	Trade Balance	Imports from Canada	Exports to Canada	Trade Balance	
CT	850.4	830.7	-19.7	829.1	823.7	-5.4	-.8%
ME	766.4	256.6	-509.8	995.3	262.8	-732.5	2.4%
MA	2,358.6	1,462.8	-895.8	2,706.4	1,773.9	-932.5	21.3%
NH	310.9	128.4	-124.6	244.6	139.0	-156.1	11.5%
RI	465.0	128.4	-336.6	244.6	139.0	-105.6	8.3%
VT	802.0	190.4	-611.6	1,034.2	367.8	-666.4	93.2%
NE	5,553.3	3,055.2	-2,498.1	6,173.4	3,574.9	-2598.5	17.0%

Note: Figures may not add up due to rounding

Source: Statistics Canada, "Domestic Exports/Imports to/from the United States, January to December 1987 (provided by the Canadian Consulate, Boston, MA); New England Council, "The U.S.-Canada Free Trade Agreement: A Study of the Costs and benefits to New England," March, 1988 (used the same data for 1986 provided by the Canadian Consulate.

Total trade between Rhode Island and Canada consisted of 78 percent shipments from Canada in 1986 and 64 percent in 1987, posting a 69 percent decrease in Rhode Island's trade deficit with Canada in one year. If growth continues in export trade with Canada, Rhode Island may see a trade surplus in the not-too-distant future.

A 1986 comprehensive trade profile for Rhode Island and Canada was prepared by the Northeast-Midwest Institute for the New England Council (See Appendix).

The New England Council report suggests the U.S.-Canada Free Trade Agreement (FTA) will benefit the New England region overall. Rhode Island mostly ships finished products to Canada which generally face higher tariffs than most raw material exports. Thus the elimination of tariffs by the Free Trade agreement should benefit the state. Industries which will benefit most are the computer and other electronics industries which already have Canadian distribution networks in place. The telecommunications equipment industry faces non-tariff trade barriers whih are not eliminated by the Agreement.

The jewelry industry, however, gains a double benefit. The cost of precious metals imported from Canada will be lower with the removal of U.S. tariffs, while Canadian tarriffs on finished products are also removed. Other Canadian imports that stand to be lower because of tariff relief include paper, lumber and non-precious metals, all important to industries of the state.

Likewise, the integration of the Common Market economies of Western Europe into a single continental economy in 1992 could provide greater opportunities for international trade if American businesses prepare now.

Because the U.S. export boom started in mid-1987 and continued through 1988, the 1988 Canadian data should prove most interesting. NEBHE staff will obtain and analyze this 1988 data as it becomes available, and incorporate it into briefing materials for Rhode Island legislative leaders later this year.

Potential Export Growth Among New England Small Businesses

Over the past 10 years, small businesses have been viewed as a key source of the nation's innovation and jobs. New England is unique among U.S. regions in that it is dominated by many small advanced-technology companies rather than large corporations. Data recently released by the U.S. Small Business Administration (SBA) show that small and medium-sized firms make up approximately 97 percent of all firms in New England and 99 percent of all firms in Rhode Island. It is Rhode Island's small businesses that provide the greatest potential for growth in exports.

Employment in New England small businesses increased 25 percent from 1976 to 1984; and small businesses provided 50 percent of all jobs in the region from 1982 to 1986.

The SBA estimates that 11,000 small businesses in the leading export industries of the nation have the capacity to export, but are not yet actively doing so. Small businesses face special challenges as exporters.

Firms with fewer than 20 employees often find exporting virtually impossible. They usually lack professional expertise in overseas markets. Obstacles include: foreign languages, time zones, taxes, regulations, international licenses and patent considerations, tariffs, customs inspection, laws, transportation and distribution systems, and varying cultural business practices.

Likewise, small businesses often lack the capital to sustain export operations through periods when the dollar's value is high relative to the

currency of the importing nation. Although small businesses have lower levels of working capital than large corporations, they incur high overhead costs when beginning an endeavor. To make matters worse, export financing is very difficult to obtain, particularly for first-timers. And small businesses are often viewed as greater risks for financing.

Nonetheless, New England small businesses do dominate the advanced-technological industries that hold the greatest potential for export trade expansion. These small enterprises hold the key to expanding state economies through exporting, and it behooves the region to nurture them.

Findings/Recommendations

A review of the Rhode Island economy in an international context suggests great promise, as well as certain key considerations for meeting the challenge of international economic competitiveness.

- U.S. citizens, in general, suffer from international myopia, and most lack a basic understanding of international issues. Basic skills of entry-level employees are often not as high as basic skills of entry-level employees in other developed nations. This hinders our ability to be economically competitive in world markets. Through attention to curriculum, higher education can foster long-term strategies to help the region address this issue.

- Although both New England and the state of Rhode Island hold their own in the U.S. international trade arena, the degree of involvement is small. Only 4.5 percent of Rhode Island's and 5.5 percent of New England's civilian employment was export-related in 1986. Strategies must be designed to nurture industrial expansion in an international context.

- At the regional and state levels a large number of small firms are a dominant economic force, and these small businesses have certain competitive features that make them well-suited for international trade. But on the whole, the degree to which they are involved in international trade is minimal. The higher-education community, government and trade-related organizations can work together to devise short- and long-term solutions to the particular problems small businesses face as they approach the international arena. The ability of this large section to compete internationally must be fostered and enhanced if New England is to sustain its economic vitality.
- U.S. data regarding the international economic position of the states and their industries is terribly outdated at the time of its release. Steps should be taken to generate better data on a more timely basis to aid state and regional policymakers in developing the international dimensions of their economies.

III. International Trade Programs in Rhode Island

Strategies to enhance international economic competitiveness already have been initiated at multiple levels. National, regional, state and local initiatives have been designed by governments, businesses and trade associations, as well as institutions of higher education. Although the projects vary widely, they generally aim to bolster economic development so that an overall competitive advantage can be sustained, or they specifically promote international trade.

While large corporations generally have the financial and human resources to devise and sustain their own unique strategies for enhancing international trade, small and medium-size firms may lack both resources and be dependent upon other organizations for counseling, training, data analysis and market research, financial assistance, opportunities to attend trade shows and other services. A wide variety of such services are available to these smaller businesses.

Federal Trade Resources

On the federal level, international trade programs are sponsored by 10 agencies: the Agency for International Development, the departments of Agriculture, Commerce, State and Education, the Export-Import Bank, the Overseas Private Investment Corporation, the SBA, the Trade and Development Program and the Office of the U.S. Trade Representative.

A recent publication of the SBA is a must for all regional organizations as well as state agencies, business and trade associations and institutions of higher education that provide international trade counseling or technical assistance.

The SBA's Exporter's Guide to Federal Resources for Small Business (1988) outlines the multitude of federal programs designed to provide financial and/or technical support to U.S. companies seeking entry into or expansion in international markets. It is an excellent resource for Rhode Island's small and medium-sized firms and for those advising them on the export process.

Two federal agencies involved in international trade deserve special attention. They are the Department of Commerce's International Trade Administration (ITA) and the SBA.

The International Trade Administration

ITA, established in 1980 to promote world trade, is the official U.S. government organization coordinating all issues concerning trade development, international economic policy and programs in the area of international commerce and import administration.

Two of ITA's four offices are charged with increasing export awareness and stimulating the export of goods and services. These offices provide individual export counseling, sponsor trade missions and fairs, develop catalog and video catalog exhibitions, provide electronic information or foreign sales leads, and conduct conferences and seminars to help companies enter new markets. Through ITA, last year 2,800 firms participated in 142 overseas trade fairs and missions reaching almost 5 million prospective buyers, agents and distributors. Projects are generally coordinated with local offices of the SBA, state agencies and area trade associations. ITA has 48 offices in the United States, as well as posts in more than 120 foreign countries.

Rhode Island's ITA office is managed by the Boston District office. Certain ITA staff are located in Rhode Island but only on a part-time, sporadic basis. ITA's biweekly publication, called Business America, is must

reading for state and local leaders involved in international trade development as well as for current and future exporters.

Small Business Administration

The SBA offers a multitude of services for the small-business person, as well as for the individuals contemplating the creation of a small business enterprise. Many SBA services are delivered locally through coordination with colleges and universities. While some SBA services are designed to assist small businesses with management in general, others are specifically geared toward providing international trade assistance, both financial and technical.

The SBA's Small Business Institutes (SBIs) offer free guidance and assistance to small businesses. The SBIs are staffed by college seniors and graduate business administration students (for academic credit) and their faculty advisors under SBA guidance. SBIs are located at Bryant College, Johnson and Wales College and the University of Rhode Island.

Small Business Development Centers (SBDCs) draw upon federal, state and local government resources, as well as the private sector and universities to provide small businesses with management and technical assistance, counseling and practical training. SBDCs in Rhode Island are coordinated by the Bryant College's School of Business Adminstration. SBDC satellite offices are located at the Opportunities Industrialization Center (South Providence), Providence Downtown Small Business Development Center, and at the University of Rhode Island (Kingston).

Of all SBA programs, the International Trade Counseling and Training Program is the most specifically related to international trade. Established in the 1970s, this program's impact is increasing rapidly as the states grapple with international trade issues. This program provides one-time free legal advice for small- and medium-sized firms that are new to exporting, as

well as counseling and financial assistance for managers of small businesses considering entry into international markets or expanding current export operations. Much of this activity is managed by the SBA's Business Development staff and coordinated with the Department of Commerce's International Trade Administration.

Regional Initiatives

Certain regional organizations are involved in promoting international trade by New England businesses. They include the Small Business Association of New England, Massport's Trade Development Unit and the International Business Center of New England.

Small Business Association of New England

SBANE, a member organization for small businesses in the region maintains an international trade committee, called SINTRAC, which meets monthly to discuss problems and issues pertinent to exporting. This committee's 36 members are drawn from small businesses that are already exporting, as well as representatives of the U. S. Department of Commerce, SBA, and appropriate state offices throughout New England. SINTRAC members also include representatives of a small number of business organizations serving the international trade community.

SINTRAC projects include training programs in export administration (co-sponsored with the International Business Center of New England), and export dialogue programs involving chief executive officers who are experienced in foreign trade and willing to share their experience in marketing and distribution, and their relationships with bankers, agents, brokers and freight forwarders. In 1989, SBANE's annual New England Business

Conference, for the first time, will include an international trade component, with general sessions on international trade, selling products overseas, financing international business, developing international joint ventures, the U.S.-Canada Free Trade Agreement and the European Community in 1992. The international component is likely to become a permanent part of the annual meeting.

Massport's Trade Development Unit

For more than a decade, the Trade Development Unit of Massport has provided referrals, research, marketing assistance and general guidance to small and medium-sized New England manufacturers seeking to begin exporting or expand current export operations. Each year, Massport assists more than 100 firms through market research and analysis of products and countries. Massport also sponsors trade shows, trade missions and business meetings, and provides general information on international business and export opportunities. In addition, for companies doing market research, Massport operates an international business library located at the World Trade Center in Boston. While the majority of Massport's clientele is based in Massachusetts, 10 percent to 25 percent is drawn from the remaining five New England states. Massport maintains international trade offices in London and Tokyo.

The International Business Center of New England

Established in 1956, the International Business Center of New England sponsors seminars and programs for businesses interested in international trade. The center coordinates its efforts with other regional organizations, as well as those serving the Greater Boston area.

Other Regional Programs

Several other regional organizations have provided policy studies and data analysis; some have coordinated workshops, seminars and meetings related to the issue of international economic competitiveness. These include the New England Board of Higher Education, the New England Caucus of State Legislators, the New England Council and the New England Governor's Association.

A Key Program

Regional, state and local economic development groups of the Greater Boston area, working with regional offices of the federal government, have designed an important program in conjunction with seven area colleges and universities, which is based on a prototype designed by the Wharton School of Business at the University of Pennsylvania and is similar to a UMASS/Amherst program that has served the business communities of central and western Massachusetts for more than five years.

Known as BEST (Boston's Export Strategy Team), this cooperative effort by Boston-area graduate business schools is designed to help local companies identify and develop strategies to capture foreign markets for their products or services. BEST may serve as a prototype for initiatives by colleges, universities and local economic development and trade organizations serving specific regions within each New England state. (See Appendix for details about BEST)

State-Level Strategies in Rhode Island

Economic Development

Rhode Island experienced a major economic slump with the 1974 pull-out of the Navy which at that time was this state's largest employer. This event

forced the much-needed economic diversification that has brought Rhode Island into its current period of tremendous economic growth. Though greatly aided by the spin-off growth that has occurred in neighboring Massachusetts, Rhode Island business leaders suggest that the key to the state's turn-around has been the fact that the state has a series of governors who have made economic development a top priority..

As the state began to recover from the recession of the 1970s, it again experienced decline in the early 1980s. Thus economic development had to be a major priority for the state over the last 15 years.

Diversification has been important in Rhode Island, particularly since this state suffered more than other New England states during the 1980-82 recession. Just as the nation's auto and steel industries declined in the Mid-Atlantic and Midwest regions, so did Rhode Island's textile and jewelry industries. Approximately 2,000 workers in textile industries were layed off while the jewelry industry, the state's second largest employer, lost one-third of its jobs.

The Greenhouse Compact

In the early 1980s, Rhode Island received national attention for its proposed $250 million Greenhouse compact, the most comprehensive economic development plan devised by any state. If enacted, the Compact was expected to create 60,000 jobs by 1990. Components of the plan included state initiatives to broaden Rhode Island's industrial base, enhance development of new industries, and improve the state's business climate. Some of the programs proposed included creation of venture capital funds, formation of four research "greenhouses" (a centers of excellence concept), development of new product incentives, establishment of a stabilization fund to provide new owners of troubled firms with debt and equity, expansion of

continuing education and training for technical businesses. The Compact was defeated by the voters in 1983, but some of its components have become realities.

Rhode Island Partnership for Science and Technology (RIPS&T)

The RIPS&T was established in 1985 as a nonprofit organization with state funding, housed in the Department of Economic Development. The Partnership encourages the business community to work with universities and colleges, medical schools and research and teaching hospitals to broaden the research base and transfer technology for economic benefit in Rhode Island. Goals are accomplished through three vehicles.

The state-supported Small Business Innovation Research Program, designed to complement the federal SBIR program by offering companies financial incentives to apply for federal funds. The program was initiated because few businesses were taking advantage of the SBIR program. Established in 1988, this state program has assisted nine businesses in securing $1,066,098 from the Federal SBIR program. What is impressive about this project is its ability to take advantage of existing programs. Proposal assistance and counseling are provided to applicants at Rhode Island SBA Small Business Development Centers (previously discussed).

The Applied Research Program (ARP) identifies innovative research projects that offer clear potential for profitable commercialization. Up to 60 percent of a project can be funded through the ARP as long as the funds are used at a Rhode Island university, college or hospital.

The Alliance Program provides seed money to research institutions to develop links with business and industry for the purpose of advancing science, technology and research. The Partnership is attempting to nurture Rhode Island's strength in health-related R&D and product manufacturing.

Workforce 2000 Council

Workforce 2000 and its funding mechanism, the Job Development Fund were created by law in June 1988 to improve current and long-term employment and advancement opportunities for residents, while enhancing the competitiveness of Rhode Island businesses through customized job training and retraining, promotion of worksite-based literacy programs, and outreach programs for the unemployed and economically disadvantaged. In just six months, training and upgrading of skills have been provided for over 600 residents of Rhode Island.

Workforce 2000 is funded in two ways. A total of $500,000 has been appropriated from the state's administrative budget to provide for council staff. And one-tenth of one percent of the state's unemployment insurance liability fund has been earmarked for training purposes, accounting for approximately $4 million annually, according to projections. Thus, no new tax funds must be generated.

The Council's executive board includes the presidents of the University of Rhode Island, Rhode Island College, Community College of Rhode Island, business leaders, and state government representatives from the departments of Economic Development, Administration, Human Services, Elderly Affairs, Employment Security, and the Commissioners of Education and Higher Education. Various economic development organizations are also represented.

The Council solicits training proposals on a competitive basis. Eligible applicants include Rhode Island employers, business and trade associations, public and private educational institutions and agencies, non-profit agencies, JTPA agencies, organized labor organizations and state agencies.

The program has purposely been designed to be open-ended and flexible in order to best meet specific training needs for various businesses in the state.

Clearly this program serves as a national model for state inititative to improve the quality and availability of the workforce. It has been recognized by the U.S. Department of Labor as such.

The Department of Economic Development (DED)

Rhode Island's DED provides its own services which include divisions of Small Business Development, Marketing, Tourism, Financial Services, Job Development and Training, Research, the Partnership for Science and Technology and International Trade. It also maintains an extensive inventory of other agencies and organizations that are available throughout the state. This is done through comprehensive guides to: services for small businesses; financing agencies for all business (state and non-profit); business support services of the state; tax and non-tax business incentives; marketing and distribution networks; industrial parks, sites and available space; and quality of life, educational and R&D throughout the state. The department promotes itself as a comprehensive and effective source to attract new business interests to the state. The state has selected as its theme, "Rhode Island, the Better Business State."

Rhode Island has a fairly impressive array of financing agencies and programs to enhance economic development. They are designed to assist with financing of real estate improvements, machinery and equipment and are managed by six different funds, for-profit corporations and authorities (see Table 7 for details).

DED also has initiated comprehensive international trade effort that has expanded in the last two years. As is the case with many other Rhode Island programs, it has been linked to several other resources in the state.

International Trade Initiatives

DED's Division of International Trade (DIT) is charged with promoting export of Rhode Island products in the international marketplace. Exporting businesses are assisted in three ways.

In cooperation with other area organizations, the DIT conducts training seminars to educate participants on fundamentals of international trade, changing federal regulations and laws, and export assistance opportunities. The Division also publishes a quarterly newsletter, Export that is mailed to the business community, as well as a Directory of Exporting Companies.

The DIT also markets Rhode Island businesses by attending international trade shows around the world which have recently been held in Japan, West Germany, Taiwan and South Korea. Firms can either participate directly or opt to have DIT staff represent them.

Finally, DIT maintains foreign offices in Europe and Asia. The European office was established in 1983. It is located in Belgium and is staffed by representatives who speak several languages. The Asian office was established in 1987 in Hong Kong and is staffed by local representatives who speak six different languages spoken in Asia. DIT provides counseling locally in Rhode Island and arranges for consultation with the European and Asian representatives during their visits to Rhode Island as well as for area business leaders' visits overseas.

Greater Providence Chamber of Commerce World Trade Club

The World Trade Club, an affiliate of the Greater Providence Chamber of Commerce, as of 1973, was established in 1959 with approximately 125 members. With a current membership of 300 (representing 165 Rhode Island companies), the Club organizes dinner meetings, whereby members involved in international trade provide information about their international experiences to other

members. Member businesses include manufacturing importers and exporters, banks, freight forwarders, and customs brokers.

Because the club is an affiliate and is not actually a full fledged service organization, plans are now underway to establish a World Trade Association in April 1989 that would be housed at the State's Export Assistance Center at Bryant College.

Small Business Export Assistance Center (SBEAC)

Rhode Island's International Task Force on Exporting, created under the leadership of Rhode Island's SBA office to bring organizations, both public and private, together to coordinate international trade efforts recommended the establishment of an export assistance center for the state. Expecting seed money from the 1988 U.S. Trade Bill, leaders began to make plans for the Center's opening. Though the Trade Bill provides for funding of export centers through the SBA, funds have not yet been appropriated. Because Rhode Island leaders were enthused about the prospect, they pooled state, Bryant College and private resources to create the SBEAC at the Small Business Development Center at Bryant College in July 1988.

The Center's programs include: free one-on-one counseling and consultation to small and medium-sized businesses; training seminars on joint international ventures, licensing and operations in exporting to specific nations; a database that keeps up-to-date information on international trade leads. Federal funds are still expected to be made available for expansion of the Center's programs.

Export information and assistance also is provided at the local level. In addition to the local Chambers of Commerce, there are various other services. On a consultant basis, several specialized services are available to businesses wishing to export. They include: export management and export

trading companies that serve as representatives to manufacturers, international trade consultants; customs house brokers; international freight forwarders; translation services; and the international departments of banks. Likewise, a wide array of technical assistance and economic development loan programs are available through the cities and towns of Bristol, Central Falls, Cranston, Cumberland, East Providence, Newport, North Providence, Pawtucket, Warwick, West Warwick, Westerly and Woonsocket. Special services are also provided for exporters by the Rhode Island Port Authority and the Port of Providence.

Unique to Rhode Island are two private organizations that promote international trade nationwide. The Providence-based Manufacturing Jewelers and Silversmiths of America, Inc. is an industry-specific trade association that serves as a clearinghouse for information on international markets, marketing, technical standards, trade shows and related matters. The U.S.-German Democratic Republic Trade and Economic Council, also in Providence, promotes trade between the two nations. A Portuguese consulate office is also located in Providence.

Findings

Although programs at the federal and regional levels have been in place for some time, those at the state level are relatively new. International trade has been considered the federal government's prerogative. But today states and municipalities have formulated international trade initiatives, and will most likely expand their roles. In the 1990s, the prerogative will be theirs.

Rhode Island, like other states across the nation, is now beginning to build the infrastructure necessary to promote international trade. More than most other states, Rhode Island has attempted to coordinate already existing

programs so their combined resources can be brought to bear on the problems of promoting international trade and economic development. Partnerships are clearly alive in Rhode Island. The key, however, is to evaluate the effectiveness of these efforts on an ongoing basis.

Table 7 outlines federal, regional, state and local programs that play key roles in Rhode Island's trade-related and economic development activities. This table does not include institutions of Higher Education which will be discussed in the following section.

TABLE 7

Major Players Involved
in Enhancing International Economic Competiveness in Rhode Island*

Financial/Technical Assistance or Information

Department of Economic Development (S/A)
Department of Environmental Management, Division of Agriculture (S/A)
International Business Center (R)
International Trade Administration (F)
Local Chambers of Commerce (L)
Manufacturing Jewelers and Silversmiths of America, Inc. (N/NP)
Massport's Trade Development Unit (R)
Port of Providence (L)
Rhode Island Port Authority (S/A)
SBANE's International Trade Committee: SINTRAC (R)
Small Business Administration (F)
Small Business Export Assistance Center (S/NP)
U.S. German Democratic Republic Trade and Economic Council (N/NP)

Policy-Related Studies/Sessions and Data Analysis

Department of Economic Development (S/A)
New England Board of Higher Education (R)
New England Council (R)
New England Governors' Association (R)

Economic Development Initiatives

Department of Economic Development (S/NP)
Ocean State Business Development Authority (S/NP)
Rhode Island Business Investment Fund (S/NP)
Rhode Island Industrial Facilities Corporation (S/A)
Rhode Island Industrial-Recreational Building Authority (S/A)
Rhode Island Port Authority and Economic Development Corporation
Small Business Revolving Loan Fund of DECD (S/A)
Workforce 2000 Council

R & D Technology Transfer

Rhode Island Partnership for Science and Technology (S/A)

*Excludes higher education initiatives which are covered in greater detail in the following section.

(F)=Federal; (L)=Local; (R)= Regional; (S/A)= State Agency or Authority;
(S/L)=State Legislature; (S/NP)= State Non-Profit; (N/NP)=National Non-Profit

IV. HIGHER EDUCATION AND INTERNATIONAL ECONOMIC COMPETITIVENESS

Because New England's economy increasingly is fueled by advanced technologies, skilled labor is critical to continued growth. International economic competition adds to our demands for a well-educated workforce, heightened levels of R&D and subsequent technological innovation. But there are signs indicating we are falling behind our economic competitors in these fundamental areas. On a national basis, the facts are disturbing:

Education and Training

- Between 20 million and 30 million adults in the United States are considered functionally illiterate.
- Participation and achievement by U.S. elementary and secondary-school students in science and math lag when compared with the performance of previous years and with the performance of students of other nations. Our middle and high school students have scored at or near the bottom on international math exams for the last several years. In addition, high school graduates in both Japan and West Germany, our major competitors, are stronger in basic educational skills. Merry I. White, an analyst of Japanese educational policy, suggests that Japanese high school graduates are as well educated as American college graduates and that any worker at a Japanese factory can be expected to understand statistical material, work from complex graphs and charts and perform sophisticated math.
- Although we boast that 50 percent of our high school graduates go on to college, only 70 percent of U.S. students complete high school, compared with Japan's 98 percent. "Their bottom half is beating our bottom half" according to economist Lester Thurow.
- U.S. professional service industries complain about the dearth of qualified workers for entry-level jobs usually filled by high school graduates. Likewise, U. S. manufacturers are finding it difficult to recruit workers who can understand robotics and computers.
- An estimated 75 percent of today's American workforce will need retraining by the year 2000.

- Recent studies suggest that U.S. universities are not turning out enough scientists and engineers--particularly at the master's and doctorate degree levels--to meet new demand in the leading-edge areas of high technology and advanced production systems. The number of engineering doctorates decreased from 2,500 in 1970 to 1,280 in 1985. In addition, only 53 percent of the engineering doctorates awarded by U.S. colleges were awarded to U.S. citizens or permanent residents. And, a shortage of top-quality applicants is expected to greet the retirement of a generation of aging science and engineering faculty.

- Top-quality students are being steered toward the lucrative professions of finance and law, creating a brain drain in manufacturing industries. The study of manufacturing processes is being neglected.

International Awareness

- The United States is one of the few developed nations where students routinely graduate from high school without competence in a second language. According to figures provided by the Southern Regional Board of Education, only 8 percent of universities require foreign language for admission, and only 5 percent of college graduates are fluent in a second language. In the United States, a student can earn a doctorate without ever having taken a foreign language course. Nonetheless, the language of trade remains the language of the customer. If we do not understand the customer, we will be unable to trade our goods, services and ideas.

- U.S. students, workers and consumers lack understanding of global geography and of the cultural and political differences between nations. Economic development and trade association leaders told NEBHE staff that this lack of international cultural awareness is one of the most significant hurdles they face in encouraging export trade by New England businesses.

R&D Investment and Technology Transfer

- The U.S. leadership position in research and development (R&D) expenditures of 25 years ago faces a serious challenge. In 1962, the U.S. spent 2.7 percent of GNP on R&D, compared with 1.5 in Japan and 1.3 in West Germany. By 1985, the U.S. figure was still 2.7, but Japan's was 2.8 and West Germany's was 2.7.

- Non-defense R&D expenditures by the United States are well below both Japan's and West Germany's. Japan spent 2.8 percent of GNP on non-defense R&D in 1985, and West Germany spent 2.5 percent. The United States spent only 1.9.

- Although the United States leads the world in advanced technological industries, its annual growth rate between 1972 and 1985 was 7.6 percent, compared with Japan's 14 percent, suggesting Japan is more effective in technology transfer for high-quality product development.

- 1987 marked the second consecutive year that foreign firms topped the list of U.S. patents awarded. Japanese firms were first and second, bumping General Electric to third.

Education In The Global Economy

International competitiveness requires educational effectiveness. Having earned worldwide respect, our systems of higher education have at hand tremendous resources to share in solving the states' problems of economic competitiveness on several levels.

Many of the problems we face in terms of lagging worker competence and lacking international awareness have traditionally been viewed as problems of elementary and secondary education. But we can no longer afford to make that distinction. The strength of the U.S. system of higher education depends on the strength of education at lower levels. International economic competitiveness rests on the strength of both systems. For this reason, viewing the educational process as a continuum will allow more effective long-term solutions to the problems presented by the global economy.

In terms of basic literacy skills and educational level, the nation's workforce presumably falls around the middle when compared with other industrialized countries. But as our products become more highly technological and our markets become global, literacy demands increase dramatically. And the United States trails even some developing countries in initiatives on literacy, basic education and worker retraining. As a result, the United States faces competition from developing countries, which not only have lower labor costs, but also are making stronger efforts to train skilled, literate workers.

Literacy and Education in Rhode Island

Rhode Island is ranked 40th in the United States and 6th in New England in terms of adult literacy. Clearly, adult illiteracy is a very serious problem in the state. Appoximately 15 percent of the adult population was considered illiterate in 1985.

Likewise, Rhode Island's high-school graduation rates have declined during the 1980s. While almost 70 percent of eligible students graduated in 1982, only 67 percent did in 1986. Average SAT scores, however, increased by 23 points between 1982 and 1988, and slightly greater numbers of students took the SATs: 61 percent did in 1982, and 64 percent did in 1988. More improvement in high shool graduation rates is necessary if the state is to compete with Japan and its 98 percent rate.

At the higher education level, Rhode Island ranked 24th nationally and fifth in New England in 1980, in percentage of population age 25 and older with a college education. While the national average was 16.2 percent, and New England's average was 19.2 percent, Rhode Island's was 15.4 percent.

In 1986, Rhode Island's higher-education enrollment as a percent of 18 to 24-year olds was almost 61 percent, ranking Rhode Island second in the region to Massachusetts. By this measure, Rhode Island fares well. Comparable figures for New England were about 53 percent and for the United States, about 47 percent.

A Long-Term Proposition

State, business and education leaders should realize that raising the educational level of the population is a long-term proposition, and quick fixes simply will not work. Raising the educational levels of Rhode Island's young people in the short-term will help cope with adult illiteracy in the long-term, while leaders devise strategies to deal with the adult illiteracy

that now exists.

Relative to recent concerns about the scientific and technically educated workforce, NEBHE completed a study in 1988 to assess the progress made by New England colleges and universities in supplying sufficient numbers of quality engineering graduates to meet industrial demands. The research showed that New England ranked first among all regions in enrollment of graduate students in science and engineering per 1,000 population. But while the region has responded well to estimated demands in engineering and related fields at the baccalaureate level, it is increasingly clear that insufficient numbers of doctorates are being awarded to meet the demand of high technology corporations and university faculties within the region.

A state-specific analysis of the capacity of the University of Rhode Island and Brown University and out-of-state institutions in close proximity to meet the needs of Rhode Island industries could be enlightening. While the number of engineering degrees awarded at all levels by URI increased considerably between 1982 and 1987, bachelor's and doctorate degrees in engineering awarded at Brown decreased considerably, while master degrees increased.

Rhode Island Initiatives to Heighten Levels of Education

The Corporation for Enterprise Development gave Rhode Island a "C" on its 1988 state-by-state report card for state educational initiatives. The state was ranked 24th nationally in this capacity. Public education spending for grades K-12 has been relatively high when compared to the actual wealth of Rhode Island's residents, but teachers' salaries did not increase substantially between 1986 and 1987. As a result, Rhode Island ranked 8th and 27th nationally in these two respective areas.

The Corporation for Enterprise Development study, however, analyzed 1986

data. Many of the new initiatives in Rhode Island took place in 1987 and 1988.

Republican Governor Diprete made education his No. 1 priority for 1987 and 1988; education was also high on the General Assembly's agenda. A $3 million dollar illiteracy and dropout prevention bill was passed in June 1987, and funding for education was up 10 percent over 1986. Solutions to both the illiteracy and dropout problems were focussed on the lower grade levels in 1987. The literacy program requires schools to provide instruction in basic skills for children in kindergarten through third grade and remediation for students who do not reach the basic levels established. Reduced class sizes in the earliest grades were also being considered as a preventive measure against the dropout rate which averaged almost 33 percent in 1986. Moreover, $3 million was appropriated for improvements to the state college system. Much of the governor's 1987 agenda was based on his concern for economic development in the state and improving education is an integral factor. Finally, in 1988, the Workforce 2000 Council and its funding mechanism, the Job Development Fund were established in 1988 to upgrade the skills of Rhode Island workers and other adults (see Section III for detail).

In the area of adult literacy, Rhode Island was one of 13 states across the nation that received a grant from the Gannet Literacy Challenge, the first large-scale non-government funded program to stimulate efforts among adult literacy groups and agencies. With these funds, the Department of Education created a telephone instruction project to bring adult education to public housing residents and unskilled or semi-skilled workers. Instruction takes place via two-way audio systems at the public housing or work sites.

Improvement of public schools was the No. 1 public policy priority of Rhode Island's business, government and education leaders surveyed in NEBHE's 1987 Future of New England Survey. Maintaining a strong economy ranked second out of nineteen issues for consideration. Business leaders credit both the

governor and the general assembly with building a strong foundation upon which the state's economy can grow.

Lack of International Awareness

In 1987, NEBHE completed a comprehensive study of the ways New England college and universities were adapting curricula and related activities to provide new understanding and competencies that are necessary in a global economy. Using a case study approach, NEBHE examined 40 colleges and universities, including public and independent two-year and four-year institutions, across the region. NEBHE considered institutional planning, business and liberal arts curricula, foreign languages, area studies, internationalization within various academic disciplines, foreign-student enrollment, study-abroad programs and library resources. The study found that the change occurring along the international dimension was one of the most powerful substantive developments in the history of higher education. But it also warned that more must be done.

Campus-based International Initiatives

What follows is a sampling of campus-based activities to promote international awareness among Rhode Island students:

- The University of Rhode Island (URI) has created dual-degree programs coupling foreign language study with business and with engineering.
- URI is the only institution of higher education in New England that offers business Portuguese courses in addition to business Spanish, French and German (the latter three are also offered at Northeastern University, in Boston).
- In 1987, Brown University established an Institute for International Studies, which some experts believe will become nationally prominent. The Center will have a strong focus on Soviet-American problems.

- Brown University strongly recommends that undergraduate applicants have taken three years of foreign languages in high school. Moreover, approximately 38 percent of all students study foreign languages at Brown.

- Brown University plans to create a new Center for the Study of Foreign Language.

- Brown University is one of eleven private institutional members across the nation of a consortium organized by Yale University with major foundation support, to focus on problems of foreign language instruction.

- Student interest in learning Japanese at Brown University has increased by more than 30 percent per year over the last several years. There are now four full-time instructors in Japanese. In addition, enrollment in the history course on early Modern Japan now exceeds that in the course, Early Modern England.

- Brown University has joined a new consortium participating in the KYOTO Program of Japanese Studies administered by Stanford University. It is for students with a strong background in Japanese language and culture.

- International relations has become one of the top three majors at Brown.

- URI is a Sea Grant institution under legislation initially offered by Sen. Pell. Because New England faces the oceans, we can anticipate that New England will have a growing set of international business developments and relationships through the marine sciences. More than 300 URI graduates, in more than a dozen disciplines, have been recipients of Sea Grant support.

- Bryant College is creating an International Studies Program and has added two new courses available to undergraduates--World Business and Its Environment and Multinational Strategies.

- Bryant College's International Business program combines business courses with liberal arts courses that have an international focus.

- NEBHE manages the New England side of the New England/Quebec Student Exchange Program. Through this program, seven Quebec and 36 public and private colleges and universities participate. The program enables students to study at Quebec institutions while paying tuition at their sponsoring home campuses. During the 1987-88 academic year, 42 students participated from the two regions.

Through early 1987, Rhode Island colleges and universities, like their counterparts in the other New England states, had concentrated their internationalization efforts on curriculum development. Although these

initiatives have been unique and impressive, comprehensive curricula planning typically has lacked focus on the global economy.

While foreign-language enrollments have risen sharply after a decade of decline, few business students study languages. Likewise there is very little global business perspective in liberal arts programs, even though most liberal arts students eventually go to work for firms which are directly or indirectly involved in world trade.

In addition, study-abroad programs are generally available, but very few overseas internships focus on business. Very few post-doctoral research fellows are funded for overseas research positions. And those who do go overseas, generally must complete a second post-doctoral assignment in the United States in order to be adequately connected to secure future employment. As a result, most are discouraged from going abroad.

Foreign-student Enrollment

Growth in foreign-student enrollment in New England as well as the nation has flattened during the 1980s in relation to the tremendous growth that took place in the 1960s and 1970s. But foreign-student enrollment in New England slowed to a lesser extent. The number of foreign students in New England grew from 23,191 in 1983-84, to 27,702 in 1987-88, less than 20 percent growth over the four-year period, but still substantial, compared with the national increase of 5 percent (339,000 to 356,000).

More striking is the relatively small number of Americans studying abroad. According to the Institute of International Education's 1986-87 "Open Doors" survey, 48,483 Americans were studying for credit abroad, compared to 349,609 foreign students studying for credit in the United States. Equally striking: While 80 percent of the Americans were studying in Western Europe and only 5.4 percent were studying in Asia, students from Asia represented

about half of the foreign students in the United States. New England has proportionately more students from Europe and Canada and fewer from Asia than does the nation as a whole. Institutions in the three northern New England states have been especially attractive to Canadian students. A further characteristic of the assymmetry of the foreign-student exchange is evident in how foreign and American students, respectively choose their fields of study.

Foreign students are learning an enormous amount about science, engineering and business management in the United States. U.S. students overseas are learning almost nothing about science and business in their host countries. Primarily, U.S. students abroad are studying fields associated with U.S. undergraduate curriculum, dominated by Western history, philosophy and culture.

More must be done to encourage study-abroad in our institutions of higher education, not only in Western nations but throughout the world. In addition, the foreign students here in New England could serve as tremendous resources of cultural knowledge not just for college students and faculty, but for middle-school and high school students and the general public.

Business-Higher Education Lack Coordination

NEBHE's 1987 case study analysis of 40 New England colleges and universities suggests that the region's business, government, economic development and trade association leaders were increasingly focusing on international issues on a tract parallel to that of the region's colleges and universities, but that efforts by the different parties were rarely coordinated.

Although higher education has international resources relevant to the business community, and foreign investment tends to be attracted to areas offering educational advantages, New England communities had not yet developed

business-higher education partnerships for international economic development. Rhode Island is actually ahead of other states in viewing its colleges and universities as a tremendous resource. NEBHE's 1987 Future of New England Survey showed that more Rhode Island leaders (almost 70 percent) viewed the state's colleges and universities as effective in preparing the workforce for a global economy than those of any other state. Most new state inititatives (science and technology, as well as worker training and others) have all worked toward linking higher education with the broader community for the state's economic gain. But still more can be done to maximize the use of this resource. Likewise, business leaders have expressed growing interest in the international economy, yet continuing education and executive development programs related to international business issues are lacking.

It is critical that efforts be made to broaden the dialogue and improve international awareness among students, faculty and citizens in general.

R&D Investment and Technology Transfer

New England's leading edge in basic research is striking. In the 1970s, the region relied upon informal relationships between university researchers and resulting spinoff businesses. Not until the early 1980s did economic policy-makers and research universities across the nation begin to understand the serious implications for all sectors when" regional" economies failed or stagnated. The result was a concentrated effort to enhance university-based technology transfer and technical assistance initiatives in order to nurture the diversification of local economies.

But because the recession of the early 1980s did not affect the New England states as severely as states in other regions, the promotion of technology transfer and technical assistance has lagged here. Now, as the region's economy seems to be peaking and international competition

intensifies, purposeful action is critical to sustaining long-term economic development.

The nation's long-term commitment to research and development has served as a seedbed for new industrial products and processes, innovative capacity and productivity gains. Federal funding of basic and applied research has been vital in sustaining a prosperous economy. It has also created a partnership among government, business and academia, which is responsible for our international leadership in scientific and technological discoveries. Since World War II, federal support for basic and applied research has grown substantially and New England organizations have been leading recipients of the federal funds.

The region's strong R&D infrastructure, particularly at the university level, allowed for the evolution of the computer industries of the 1970s and the biotechnology, artificial intelligence and various software engineering industries developing in the 1980s. Nurturing R&D is crucial for state and regional economic development.

Rhode Island's Share of Federal R&D

Organizations in the state of Rhode Island have been funded at increasingly higher levels by the federal government for R&D between 1980 and 1986. Rhode Island has improved its 31st ranking in 1980 to 25th in 1986, with a 162 percent increase in funding levels over the six-year period, second only to New Hampshire in this capacity among New England states. The Department of Defense dwarfs all other agencies as a source of funds to Rhode Island. Almost 87 percent of all federal funds appropriated to the Ocean State are from DOD (up from 76 percent in 1980), while 5.8 percent are from the Department of Health and Human Services. All other agencies contribute less than four percent. While Rhode Island's 25th ranking nationally in all

federal funds in 1986 is up from 35th in 1985, its ranking in terms of O funds only increased from 21st to 19th. The Ocean State dropped from 26th to 40th in total Health and Human Services funding and from 32nd to 42nd in funds from NASA.

Rhode Island's colleges and universities posted a one-year 10 percent gain in federal R&D funding between 1985 and 1986--the highest gain in New England. This compares favorably with the region's 3.1 percent gain and the nation's 5.7 percent gain.

Rhode Island's colleges and universities have a relatively high distribution of funds from five federal agencies: 29 percent from the Department of Education, 20 percent from the National Science Foundation, (NSF), 17 percent from Health and Human Services, 13 percent from the Department of Defense and 11 percent from the Department of Energy. Together NSF and Health and Human Services funding make up approximately 31 percent of Rhode Island universities' total federal R&D funds. This is indicative of their growing strength in life science and biomedical research.

Five colleges and universities in Rhode Island rank among the top 40 in New England in terms of university R&D obligations from all agencies: Brown University (7), University of Rhode Island (14), Rhode Island College (22), Johnson and Wales College (28), and Community College of Rhode Island (37).

Brown University also ranks among the top 75 universities nationally in this capacity. Up from 88th in 1985, Brown ranked 72nd in 1986 with almost $40 million.

In New England, the University of Rhode Island is third to the University System of New Hampshire and MIT in Department of Commerce funds, and 8th in DOD funds, regionally, while Brown University is fifth in funds awarded by the Department of Defense. In the Department of Education, funds URI, Rhode Island College, Brown and Johnson and Wales rank 12, 14, 15, and 17, in the

region respectively.

URI ranks 2nd among universities in the region in funds granted by EPA, 15th in funds from Health and Human Services and 7th in NSF funds, while Brown ranks 3rd in Department of Energy funds, 4th in NASA funds, 5th in NSF funds, and 10th in Health and Human Services, .

R&D Expenditures at Colleges and Universities

On the expenditure side, Rhode Island colleges and universities fare much like the nation and region on the whole. Slightly more than 75 percent of R&D expenditures are from the federal government, while 10 percent are institutionally funded and 7 percent are funded by industry. State and local governments contribute even a smaller share in Rhode Island (1.5 percent) than the New England average (2.3 percent). The National average is 8.4 percent.

As was the case with federal obligations to higher education, Rhode Island leads the region in its percentage gain in expenditures from 1985 to 1986 at 13 percent. The New England average was only 8.6 percent.

Broken down by academic discipline, Rhode Island is very well-balanced in its R&D expenditures, with the environmental sciences being the state's strength. Environmental sciences make up 43 percent of Rhode Island university R&D expenditures while the life sciences, engineering, and physical sciences make up 21 percent, 17 percent, and 9 percent, respectively.

Nationally, Brown Univerity is ranked 97th in total R&D expenditures and 51st nationally in industrially sponsored expenditures. The University of Rhode Island ranks 68th nationally and 3rd in New England among public institutions of higher education in R&D expenditures from all sources, while Brown ranks 30th nationally and sixth regionally among independent institutions of higher education.

National Institutes of Health Funding

In National Institutes of Health (NIH) funding--which is a measure of biomedical research activities--Brown ranked 79th nationally and 11th regionally, while URI ranked 185th nationally and 15th regionally among all institutions of higher education in 1987. Thirty-four colleges and universities in New England were awarded NIH funds. Brown University's Medical School ranked 9th regionally and 76th nationally among all medical schools in NIH funds, while six Rhode Island independent hospitals ranked among the top 100 nationally in NIH funds. They include Rhode Island Hospital (22nd nationally, 10th regionally), Memorial Hospital (25th nationally, 11th regionally), Roger Williams General Hospital (32 nationally, 14th regionally), Miriam Hospital (47th nationally, 16th regionally), Women and Infants Hospital (71st nationally, 19th regionally), and Emma Pendleton Brodley Hospital (89th nationally, 21st regionally). Four of the six are teaching hospitals affiliated with Brown University Medical School.

Summary Remarks

Given the state's size, R&D funding to Rhode Island organizations is fairly high.

There are certainly areas of strength that can and are being nurtured. Rhode Island colleges and universities received a substantial increase in both federal funds and total expenditures from 1985 to 1986. Likewise they were second only to Massachusetts by .3 percent in increases in NIH awards. Research strengths appear to be in the environmental sciences, followed by the life sciences, engineering and the physical sciences. Levels of NIH funding suggest that the Ocean State has an advantage in health-care related R&D. The degree to which R&D is taking place in engineering and the physical sciences

shows an additional strength in manufacturing research. Both areas are being nurtured by the Rhode Island Science and Technology Partnership.

Technology Transfer and Technical Assistance

In the areas of technology transfer and technical assistance, many Rhode Island colleges and universities have taken creative steps to help improve the health of local economies. Various initiatives have expanded technical and entrepreneurial assistance in economic and community planning, worker retraining, and general technology transfer as well as consultations to small and medium-sized firms, the creation of new business-university research parks, university industrial liason programs, scientist exchange programs and, technical and administrative support to university researchers interested in moving basic research forward for application. In addition, some initiatives have provided incubator space at university research facilities for new business ventures and established joint venture capital funds.

As noted in Part III of this paper, the creation of Rhode Island's Science and Technology Partnership in 1985 is an important beginning in efforts to coordinate R&D and enhance technology transfer for the state's economic benefit. Further, the Partnership sees strength in health-care related R&D as well as robotics and automation research as strengths that can be nurtured. The Partnership has asserted the importance of higher-education research activities as a major long-term resource for international economic competitiveness of the state.

University-Based Technology Transfer

Some newer technology-transfer and technical-assistance initiatives have been generated by the universities themselves. Some are still in the planning stages. A sampling of Rhode Island's university-based initiatives follows.

- In January 1989, Rhode Island College opened its center for Industrial Technology. This $3 million facility has been designed for RIC students and the area industrial community, as well. The Electric Boat Division of General Dynamics already has 200 workers enrolled at the Center. The Center's goal is to devise better methods of production and cost control for the nation's manufacturers. Keying in on the management of production processes, programs include general technology, technical supervision, electronics technology and graphic arts technology.

- In 1988, the Institute for International Business was established at URI through an initial grant of $150,000 from Pittsburgh Plate and Glass, the world's largest manufacturer of flat glass and industrial coating. The institute has been designed to strengthen the university's commitment to international business education. Through one of its projects, a computerized program has been created to test "exportability" of the Ocean State's products and analyze the ability of firms in a given industry to market products abroad. The state receives an assessment of the risk involved in marketing a particular product abroad, while firms are given an assessment of their strengths and weaknesses.

- The Program for Capital Markets Research of Pacific Basin Countries, to be carried out under the aegis of URI's Institute for International Business, is designed to position the university as the world's central source of data on the stocks and bond markets of 11 Asian nations.

- With college, state and private funds in July 1988 Bryant College became the home of the state's export assistance center; providing counseling, market research, and several other services for businesses interested in exporting.

- Brown University, URI and the State Department of Economic Development have cooperated to publish the Rhode Island Biomedical Research Directory, listing researchers and their activities.

- Brown University has created the Brown Venture Forum, a project that brings entrepreneurs and potential venture capitalists together on a regularly scheduled informal basis to share ideas about investments and their potential for gaining development funds.

- Both URI and Brown University have research foundations, whose goals are to identify research projects that might have applicability for commercial development, to assist university researchers in protecting applying research and to provide counseling in the area of patents, licensing and referrals to outside sources of potential funding.

- The International Association of Students in Economics and Business Management (AIESEC) is headquartered at Brown University. AIESEC has affiliates at 440 colleges and universities in 60 member nations and provides trainees to businesses from six weeks to 18 months who are capable of undertaking tasks on special projects in accounting, finance, computer science, marketing, international market research and other business-related fields.

- Through a $600,000. grant from Ford Motor Company, URI's Department of Industrial and Manufacturing Engineering is creating a "design for assembly" program that is hoped to significantly reduce automobile assembly costs.

- URI, Brown University and the state have entered into a three-way partnership for "the film" technology that will benefit electroplating, jewelry and electrical components firms.

Coordinating Efforts

As noted previously, NEBHE's 1987 case study revealed campus efforts toward internationalization were not coordinated with those of business, government and the economic development community. This update has found that in 1988 and 1989, much more is happening to foster this coordination.

University faculty and administrators have traditionally shared their work within academia. Findings have been shared beyond the academic community on occasion, but generally only at a national level.

Because this reaching out to an expanded community is very new to many academic researchers and administrators, the state and business leaders should continue to take steps to foster this type of relationship. With continued efforts to coordinate various activities, Rhode Island campuses, businesses, government offices and economic development groups are laying a solid foundation to ensure the state's global economic competitiveness.

V. Recommendations

The following recommendations aim to enhance the Rhode Island higher education community's reponse to the challenge of global economic competitiveness. These recommendations do not relate strictly to higher education initiatives, but all require the diversity of talent that exists in the academic community in partnership with business and government leaders.

Education and Training

To leaders of higher education, government and business:

- o Use university resources, coordinated by the state Department of Economic Development, to initiate a study of industrial demand for scientists and engineers on a statewide basis.
- o Create campus-based global education centers to:
  - Help local teachers at all levels upgrade basic education;
  - Develop model instructional materials;
  - Coordinate a university-based speaker's bureau to encourage early interest in science and engineering careers.

International Awareness

To leaders of higher education, government and business:

- o Establish a mechanism for Rhode Island businesses and the state to fund study-abroad programs in non-Western regions.
- o Use global education centers to:
  - Assist local teachers at all levels in introducing an international focus to curricula;
  - Expand opportunities for a wide variety of foreign-language study in elementary, middle and high schools, as well as international affairs courses in high schools.

To leaders of Higher Education:

- Provide opportunities for high school students to participate in foreign-language and international affairs programs at campus-based summer institutes. Also, use the summer institutes to provide teachers at all levels with new internationally focused curricular resources.

- Encourage Rhode Island firms doing business abroad to assist in expanding internship possibilities for students.

- Focus on the global economy in liberal arts and in general education to familiarize undergraduate students with the larger international concerns that will have an impact upon their lives and careers.

- Expand dual-degree programs, particularly for business and engineering students, so they can gain knowledge of a specific world region, learn a foreign language, and have opportunities for overseas internships related to their fields of study.

- Reinstate language requirements for admission to four-year institutions.

- Attempt to build a presence on campus of foreign students from all world regions, and encourage their involvement in programs designed to enhance international awareness among native students and local residents.

- Initiate continuing education and executive development programs in international business, international affairs and foreign languages, with particular emphasis on international management courses or programs for engineers and other high technology personnel.

To the New England Board of Higher Education:

- Undertake a regionwide review to determine which of New England's trading partners or potential trading partners are inadequately served by campus-based "area studies" centers, and encourage creation of new centers to fill the gaps.

- Encourage new and existing area studies centers to:
  - Establish semester exchange programs in international affairs, foreign language, liberal arts and business;
  - Share relevant studies on trade, regulatory, monetary and economic development policy studies with government agencies and legislators as requested throughout New England;
  - Provide seminars and literature for New England business people who want to begin exporting or expand current export operations;
  - Develop relationships with foreign institutions to provide a framework for faculty and student exchange, as well as joint research and curriculum development opportunities.

R&D Investment and Technology Transfer

To leaders of higher education, government and business:

- o Establish a statewide technology transfer council with representatives of business and appropriate university-based research centers and foundations, under the direction of the Rhode Island Partnership for Science and Technology, to coordinate:
  - Development of research parks;
  - Provision of seed money or venture capital;
  - Creation of incubators for new companies;
  - Evaluation of scientific and technological strengths that could be nurtured for economic diversification.

- o Study financial markets to determine whether an expanded state-supported venture capital fund is needed.

- o Evaluate Rhode Island's R&D funding levels and assess research projects that, with funding, could contribute to long-term economic development.

- o Establish a mechanism for businesses and the state to provide funding for expanded seminar programs, allowing exchange between university R&D staff and state industrial R&D staff.

To leaders of higher education:

- o Create interdisciplinary institutes between schools of business and engineering to develop an integrated approach to competitiveness (Rhode Island College's Center for Industrial Technology serves as a model for such an initiative).

- o Through graduate schools of business, coordinate efforts with economic development agencies and trade organizations to make more technical assistance available to local busniesses. (Boston's Export Strategy Team serves as a model for such an initiative--See Appendix for details).

- o State university campuses should use their advanced research, public policy and area studies centers to increase involvement in state-specific policy studies and technical assistance for Rhode Island's long-term economic and international trade development.

- o The six Land Grant Colleges of New England should devise a coordinated computer database for the region to generate needed demographic and economic data relevant for timely state planning (The California Almanac provides a good model for such an undertaking).

- o Rhode Island research universities should consider establishing research, productivity and technology transfer centers.

- The URI's International Business Institute should create an annual directory of faculty research expertise to include activities of the public and private institutions of higher education in the state. The directory should be disseminated to high technology companies and international businesspeople throughout the state.

To the New England Board of Higher Education:

- Assist research universities, technology-based companies and New England state governments in evaluating ways for faculty, post-doctoral students, and industrial engineers and scientists to pursue research sabbaticals in other nations.

APPENDIX

Who are the business schools involved in BEST?

The business schools involved are:

- Babson College
- Bentley College
- Boston College
- Bunker Hill Community College
- Northeastern University
- Suffolk University
- University of Massachusetts/Boston

Who are the organizations participating in BEST?

Public and private organizations involved in the program include the:

- City of Boston's Economic Development and Industrial Corporation (EDIC)
- International Coordinating Council (ICC)
- International Business Center
- Massport's Foreign Trade Unit
- Massachusetts Industrial Financing Authority (MIFA)
- State's Office of International Trade and Investment (OITI)
- Small Business Administration (SBA)
- Small Business Association of New England (SBANE)
- World Trade Institute

What does it cost to participate in BEST?

A $200 fee is charged to participate in BEST. It covers the incidental costs students will incur during the semester in preparing the feasibility study (phone calls, transportation, printing, etc.) and the administrative costs of running the overall BEST program.

For further information about BEST, please give one of us a call.

Andrew Bendheim Massport, 439-5560
Paul Horn EDIC/Boston, 725-3342

Charlie van Nederpelt
Boston College, 552-3167

August, 1988

Boston's Export Strategy Team

B.E.S.T.

A Program to Assist Small Businesses in the Exploration of International Marketing Opportunities

A cooperative effort of Boston-area Business Schools and International Trade Organizations

WHAT YOU SHOULD KNOW ABOUT THE

B.E.S.T.

Boston's Export Strategy Team

What is BEST?

BEST is a cooperative effort by leading Boston-area graduate business schools to help local companies identify and develop strategies to capture foreign markets for their products or services. By combining university research talent with the expertise and resources of local economic development and trade organizations, BEST offers companies a unique opportunity to understand and pursue their export potential.

Who should participate in BEST?

BEST is specifically designed for Boston-area companies serious about making the most of their export potential.

How will BEST work for you?

Participation in BEST provides your company with three basic services:

1. A Practical Guide for Implementing Your Export Program. A professional market analysis and feasability study, prepared by a graduate student consulting team closely supervised by a business school faculty member in international marketing will provide your company with an export strategy. This will include recommendations on:

- o alternative export markets
- o marketing objectives
- o marketing strategies
- o product adjustments
- o promotion mix
- o distribution channels
- o pricing strategies

2.) Speakers on Export Topics. Trade experts will offer practical perspectives on important export topics: on the "nuts and bolts" of exporting as well as current trends. Specific topics will be chosen to reflect your company's particular export concerns. The discussions will center on developing strategic responses to assist you in strengthening your position in international trade.

3.) Ongoing Assistance. Through its public and private sector sponsors, BEST will assist you further in obtaining information and services necessary to implement your export program. Organizations such as the World Trade Institute, Massport's Foreign Trade Unit, the State's Office of International Trade and Investment, and the Small Business Administration will help BEST clients take advantage of their respective trade libraries and data bases. The City of Boston's Economic Development and Industrial Corporation (EDIC), and the Massachusetts Industrial Finance Authority (MIFA) will provide financing assistance to exporters.

APPENDIX

THE U.S. - CANADA FREE TRADE AGREEMENT

"A Study of the Costs and Benefits to New England"

A New England Council Report

March 1988

15. Trade Profile for Rhode Island

Given its size, Rhode Island is a substantial trading partner with Canada, with $593 million in bilateral trade in 1986. Of this amount, $465 million, or 78 percent, consisted of imports from Canada to Rhode Island, while $128 million in products was exported to Canada. The state thus posted a $377 million trade deficit that year. As shown in Figure 7, most of this deficit comes from Canada's shipments of fabricated materials, particularly precious metals.

Rhode Island Exports

On the export side, Rhode Island ships a relatively large amount of finished goods to Canada, as seen in Table 11. Most finished products are very labor and capital intensive, providing many jobs and considerable profit potential.

As shown in Table 11, computers are the leading export from Rhode Island to Canada , amounting to $14 million in 1986. These goods currently face a 3.9 percent tariff which would be eliminated immediately under the FTA. This industry, one of Rhode Island's largest employers, could increase its market in Canada with the removal of even this low tariff. Computer software, a significant industry in the New England area, is not directly addressed by the FTA.

Other leading Rhode Island exports to Canada are jewelry, watches and silverware, with $10 million in shipments in 1986. This is one of the most important industries in Rhode Island. Canada currently imposes tariffs of up to 13.8 percent on jewelry, compared to 7 percent in the United States. The FTA would eliminate these tariffs over a five-year period. Games and toys, metalworking equipment, industrial machinery and some telecommunications equipment constitute most of the other finished products that the state exports.

Rhode Island exports a small amount of fabricated and crude products to Canada, most of which are less capital and labor intensive than finished goods

Figure 7

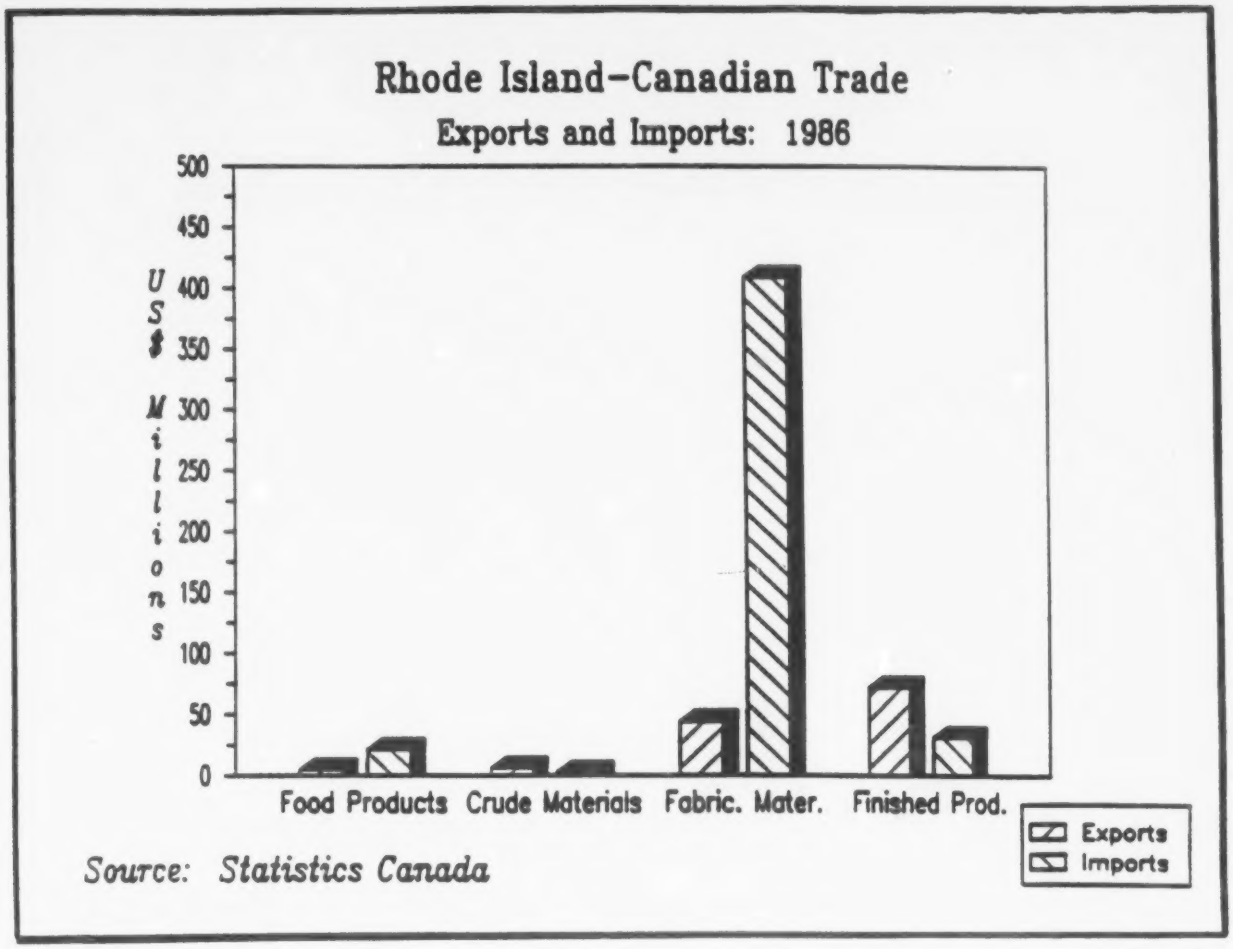

Rhode Island–Canadian Trade
Exports and Imports: 1986
US $ Millions
500
450
400
350
300
250
200
150
100
50
0
Food Products
Crude Materials
Fabric. Mater.
Finished Prod.
Exports
Imports
Source: Statistics Canada

Table 11
Leading Rhode Island Exports to Canada
By Major Commodity Category: 1986

Commodity	U.S. $1000s	Percent of total category
Food, Feed, Beverages, Tobacco		
Fish and Fish Products	4,302	90
Food and Food Materials	306	6
Cereals and Cereal Products	179	4
Fruit and Fruit Juices	11	0
Live Animals	4	0
Total for five leading exports	4,802	100
Total for commodity category	4,803	
Crude Materials		
Metal Ore and Scrap	4,316	68
Man-made Fibers	822	13
Wool and Fine Animal Hairs	338	5
Crude Wood Materials	86	1
Rubber, Gums and other Crude Vegetable Products	64	1
Total for five leading exports	5,626	89
Total for commodity category	6,316	
Fabricated Materials		
Metal (Non-precious) and Basic Metal Products	15,463	35
Textile Fabricated Materials	6,397	14
Precious Metals	5,783	13
Rubber and Plastic Materials	4,225	10
Glass Basic Products	3,301	7
Rubber Fabricated Materials	2,406	5
Pigments, Paints and Other Chemicals	2,147	5
Paper and Paperboard	1,356	3
Natural and Synthetic Gemstones	974	2
Total for nine leading exports	42,052	95
Total for commodity category	44,155	

(Table 11 continued)

Commodity	U.S. $1000s	Percent of total category
Finished Products		
Electronic Computers	13,996	19
Watches, Clocks, Jewelry and Silverware	10,451	15
Games and Toys	3,888	5
Metalworking Machinery	3,844	5
Stationer's and Office Supplies	3,373	5
Electrical Lighting and Equipment	3,130	4
Engines, Generators and other General Industrial Machinery	2,940	4
Electrical Instruments and Measuring Equipment	2,593	4
Electronic and Telecommunication Equipment	2,324	3
Medical Equipment and Supplies	1,871	3
Motor Vehicle Parts	1,537	2
Containers and Closures	1,677	2
Apparel	1,594	2
Safety and Sanitation Equipment	1,560	2
Plastics Machinery	1,259	2
Textile Machinery	1,150	2
Printing Machinery	1,044	1
Aircraft Engines and Parts	590	1
Total for 18 leading exports	58,821	82
Total for commodity category	72,049	

SOURCE: Staff calculations from Statistics Canada, "Domestic Exports/Imports to/from the U.S.A, January to December, 1986."

and generally represent smaller profit potentials. Metals and metal fabricated products, including valves and other such hardware, top this list with $15 million worth of exports from Rhode Island to Canada in 1986. Textile products, including cloth and yarn, accounted for $6 million. The textile industry is very well protected in Canada with high tariffs as well as other non-tariff barriers and subsidies. This complicated issue is discussed in the textiles section of this report. Rhode Island also ships to Canada a small amount of precious metals, plastics, glass, rubber, paints, and paper products are also shipped from Rhode Island to Canada. Canada also depends on Rhode Island for some of its food, importing $4 million worth of fish and marine animals from Rhode Island in 1986.

Rhode Island Imports

Most of Rhode Island's imports from Canada are fabricated materials, as shown in Figure 7. Topping the list is precious metals, accounting for $302 million or 65 percent of Rhode Island's 1986 imports from Canada. Much of this is made into jewelry or silverwear by Rhode Island's precious metals industry. Because most of these metals are imported for further manufacturing rather than direct consumption, Rhode Island's large deficit with Canada can give a distorted view of the actual trade situation.

Other leading fabricated products Rhode Island imports include newsprint and other papers, with $41 million shipped duty-free in 1986, and metal fabricated products, with $20 million in 1986. Large volumes of lumber, especially softwood, comes from Canada, with shipments valued at $20 million in 1986. Other fabricated products shipped include oils and waxes, plywood, and chemical products.

Rhode Island also imports some food products from Canada, including $12 million in fish and fish products and $5 million in meat. Most unprocessed food is shipped duty-free; the FTA would preserve this duty-free status.

In addition to fabricated materials, Canada ships a variety of finished products to Rhode Island. The leading products include ships and boats, with $4 million in 1986. Motor vehicles and large volumes of parts also are shipped south, amounting to almost $4 million in 1986. Telecommunications equipment is another leading import from Canada with $3 million in 1986 shipments. Other major imports from Canada include tools and equipment, office machines,

Table 12
Leading Rhode Island Imports from Canada
By Major Commodity Category: 1986

Commodity	U.S. $1000s	Percent of total category
Food, Feed, Beverages, Tobacco		
Fish and Fish Products	11,678	54
Meat	4,996	23
Cereals and Cereal Products	1,701	8
Whiskey and other Beverages	1,546	7
Vegetables and Vegetable Products	923	4
Total for five leading exports	20,845	97
Total for commodity category	21,511	
Crude Materials		
Asbestos and other Crude Non-metallic Minerals	1,583	54
Crude Vegetable Products	476	16
Seeds for Sowing	263	9
Crude Wood Products	237	8
Metal Ore and Scrap	192	7
Total for five leading exports	2,751	
Total for commodity category	2,926	
Fabricated Materials		
Precious Metals and Alloys	301,750	74
Newsprint and other Paper	41,132	10
Metals (Non-precious) and Metal Products	19,605	5
Lumber	19,546	5
Oils, Fats, Waxes and Derivatives	6,467	2
Shingles, Plywood and other Wood Fabricated Materials	4,859	1
Organic and Inorganic Chemicals	2,540	1
Rubber and Plastic Materials	1,589	0
Petroleum and Coal Products	1,395	0
Textile Fabricated Materials	1,008	0
Total for ten leading exports	399,893	98
Total for commodity category	409,164	

(Table 12 continued)

Commodity	U.S. $1000s	Percent of total category
Finished Products		
Ships, Boats and Parts	3,938	13
Motor Vehicle Parts	2,886	9
Telecommunication Equipment	2,858	9
Hand Tools and Equipment	2,604	8
Medical and Laboratory Equipment	2,098	7
Office Machines	1,675	5
Electric Lighting and Equipment	1,438	5
Apparel and Accessories	1,400	4
Drilling, Excavating and Mining Machinery	1,115	4
Printed Material	1,001	3
Motor Vehicles	978	3
Containers and Closures	879	3
Prefabricated Buildings and Structures	823	3
Plastics Industry Machinery	496	2
Engines, Generators and Other General Industrial Machinery	323	1
Metalworking machinery	269	1
Total for 16 leading exports	24,782	79
Total for commodity category	31,300	

SOURCE: Staff calculations from Statistics Canada, "Domestic Exports/Imports to/from the U.S.A, January to December, 1986."

electric lighting equipment, industrial machinery, apparel, and printed material.

Summary

Rhode Island, which ships mostly finished products to Canada, would benefit from the provisions of the FTA. Finished goods generally face higher tariffs than most raw materials and producers of these goods and therefore have more to gain from the FTA.

Rhode Island's computer industry would be one beneficiary of lowered tariffs. This industry, which already has its Canadian distribution network in place in Canada, could anticipate greater sales with the removal of the tariffs. Other electronic equipment manufacturers would also benefit from a reduction of Canadian tariffs, which can be as high as 18 percent (see Table 1). The telecommunications equipment industry faces other non-tariff trade barriers which are not elimianted by the FTA.

The jewelry industry, which is very important in Rhode Island, would receive double benefits from the FTA. First, their cost of materials, primarily precious metals from Canada, would be lowered with the removal of U.S. tariffs on imported gold and silver. Second, the removal of Canadian tariffs on finished jewelry products could increase their market share in Canada

Other Rhode Island industries would also benefit from the removal of tariffs on the raw materials which they import from Canada, including paper, lumber, and non-precious metals. Removal of tariffs would lower the costs of these raw materials.

END

U.S. Dept. of Education

Office of Education
Research and
Improvement (OERI)

ERIC

Date Filmed

March 29, 1991